THE IMPACT OF PUBLIC INSTITUTIONAL QUALITY ON ECONOMIC GROWTH IN EU COUNTRIES: PANEL DATA ANALYSIS

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AB Ülkelerinde Kamudaki Kurumsal Kalitenin Ekonomik Büyümeye Etkisi: Panel Veri Analizi

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ARTICLE INFORMATION	ABSTRACT
	There are many empirical studies in the literature about the relationship between institutional factors and economic performance. In some of these studies, one-way relationships were observed among the relevant variables, and bilateral relationships were observed at others. In this research, based on the available literature, the possible impact of public institutional quality on economic growth in EU countries for the period of 2002-2019 was investigated. The institutional quality series used in the study; It was created by taking the arithmetic mean of the values of the series government efficacy, regulatory quality, control of corruption, rule of law, accountability, political stability, and absence of violence / terrorism. In the findings obtained; It has been determined that the higher the institutional quality in the public, the higher the economic growth.
MAKALE BİLGİSİ	**ÖZ**
	Literatürde kurumsal faktörler ve ekonomik performans arasındaki ilişkiye dair birçok ampirik çalışma bulunmaktadır. Bu çalışmaların bazısında ilgili değişkenler arasında tek yönlü bazısında ise çift yönlü ilişkiler gözlemlenmiştir. Bu araştırmada mevcut literatüre dayanarak, 2002-2019 dönemi için AB Ülkelerindeki kamudaki kurumsal kalitenin, ekonomik büyüme üzerindeki olası etkisi araştırılmıştır. Çalışmada kullanılan kurumsal kalite serisi; Hükümet etkinliği, düzenleyici kalite, yolsuzluğun kontrolü, hukukun üstünlüğü, hesap verebilirlik, siyasi istikrar ve şiddetin / terörizm yokluğu değerlerinin aritmetik ortalaması alınmak suretiyle oluşturulmuştur. Elde edilen bulgularda; kamudaki kurumsal kalite arttıkça, ekonomik büyümenin de arttığı tespit edilmiştir.

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1. Introduction

The institutional approach focuses on economic, legal and political institutions and suggests that the market system will provide incentives for market participants to invest in human and physical capital and develop innovative production methods if appropriate institutions are found (Artan and Hayaloğlu, 2014:351). From this aspect, politics and public administration are closely related to the efficiency of an economy in a country. The disfunction of rules of the economic environment, choosing the rules of the game by politicans or by powerful interest groups within the frame of their utility maximizing; these facts drives the market away from efficiency and creates an obstacle to economic growth. There are many studies suggesting that regulations should be made by the state in order to remove such barriers, which are mostly seen in less developed countries. Therefore, many variables representing institutions such as economic freedom, property rights, rule of law, and political structure are included in the growth models in studies that question the determinants of economic growth. As a result of the studies carried out, a strong consensus has been reached that there is a positive relationship between institutional quality and economic growth. (Aytun and Akın, 2014:90). In this study; the effects of six variables on economic growth are investigated. These variables are; state effectiveness, regulatory quality, control of corruption, rule of law, accountability, political stability and the absence of terrorism.

Government effectiveness; It is qualified mostly by the quality of public services and officials, the degree of independence from political pressures, the quality of policy formulation and implementation, and the reliability of the government's commitment to such policies (Apaza, 2009:139). The change in the approach to the role of the state has affected public administration structurally and functionally. With the concept of New Public Management, the operation of the state on the basis of efficiency and according to private sector techniques and methods has been the dominant paradigm after 1980. This approach; It has integrated concepts and practices such as market, competition, mission, result orientation, performance, participation, transparency, entrepreneurship and quality in management into public administration. In this context, the search for efficiency and productivity encourages new institutional arrangements in public administration. Rational distribution of public services among units; establishment of regulatory and supervisory organizations with new units for new service areas; are an example for establishment of steering and monitoring units for reform studies (Akyel and Köse, 2010:10-15).

Regulatory Quality is the government's ability to impose strong economic policies and regulations to encourage and ensure private sector development (Apaza, 2009:139). The quality of the regulatory system; it includes that non-restrictiveness of the

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government, encouraging the private sector and to be able to create and implement policies that don't increase costs (Yendi, 2011:360).

Controlling corruption, expressed as the abuse of public power for private gain, is a challenging task. It is alleged that actors rely on monopoly power over a good or service, have discretion over how that good or service is allocated, and may engage in more corruption in cases where adequate accountability measures are not implemented. In this context, reducing monopolies; reducing discretion over the allocation of a good or service; Increasing the adequacy of the accountability mechanisms of the actions of an individual may be the solution. As an anti-corruption measure, the introduction of harsh sanctions, the establishment of new and stricter laws, and the initiation of institutional reforms have an important place (Graycar and Sidebottom, 2012:385-386).

There is no global agreement on the definition of the term "rule of law". Theorists at least agree that the definition requires everyone, including the government, to be accountable to the law. Rule of law; It requires measures to ensure equality before the law, accountability before the law, justice in the application of law, legal transparency and avoidance of arbitrariness, separation of powers, participation in decision-making, adherence to the principles of legal certainty (McKay, 2015:12).

Liability in public administration; It can be defined as the obligation to explain the decisions taken, works and expenses made by the management to the relevant authorities, to explain the reasons and justify them. Everyone who uses public authority and resources should be accountable to the relevant authorities on administrative, financial, legal, ethical and performance issues due to this power and resource use (Eryılmaz, 2018:383).

Political stability and the absence of violence means that the government is unlikely to be destabilized by violence or by unconstitutional means, including terrorism. (Apaza, 2009:139).   One of the main arguments that these studies are based on is that uncertainty interferes with economic decision-making processes such as investment, production and employment. As a matter of fact, if there is a high probability of a change in management, there is an uncertainty about the changes which the new government will take in related policies. As a result of that fact, economic players who do not want to take risks can take a step back in these matters and even resort to alternatives such as investing abroad and exit the economy. Foreign investors, who like stable political environments, leave or do not prefer the economy which is questioning. All these factors negatively affect the growth of GDP. (Karahan and Karagöl, 2014:2).

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2. Literature

It is seen that the relationship of institutional factors, which are represented by very different variables in the literature, with growth, has been intensively examined empirically in many studies. In this context; In the studies performed by Helliwell (1994), Burkhart and Lewis-Beck (1994), where democracy is used to represent institutional quality, causality relationships from institutional quality to economic growth have been observed. Again, Maura (1995) determined a causality relationship from institutional quality to economic growth in his study. Together with, in a study by Martin (1997) where institutional quality is represented by property rights and the rule of law; It has been determined that institutional quality has a positive effect on economic growth.

Using corruption as an institutional quality variable, Tanzi and Davodi (1997) found in their study that corruption causes a contraction on investments. Olson et al. (2000), in their study, investigated the effect of governance on productivity and in the results they obtained; They found that institutional factors are an important determinant of productivity increases.

Dollar and Kraay (2000) found in their study that the rule of law have increased real per capita income. However, they observed that democracy did not have a strong effect on income. Dawson (2003) observed a bidirectional causality relationship between freedoms and economic growth which he used them as an institutional quality variable. Again, Vega and Alvarez (2003) found in their study that they represented institutional quality with freedoms, that economic growth had a positive effect on institutional factors. Ulubaşoğlu and Doucouliagos (2004), on the other hand, found that political and economic freedom increases economic growth in their studies, which they represent with political and economic freedom.

Huynh and Chavez (2009) empirically examined the impact of governance on growth in 127 countries in their study. In the findings they obtained; Voice and Accountability, Political Stability and Absence of Terrorism, Rule of Law which are among the institutional factors, have significant statistical relationships with economic growth. Siddiqui and Ahmed (2010) investigated the effect of institutional quality on economic growth in 43 countries. In their findings, they determined that there is an important relationship between economic growth and institutional quality.

In addition to these; Lau et al. (2014) In their study examining Malaysia for the period 1984-2008; Nawaz et al. (2014) in their study of Asian economies for the period 1996-2012; Nguyen et al. (2018) in the study where they obtained 29 developing countries for the period of 2002-2015; Salman et al. (2019) observed the positive effects

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of institutional quality on economic growth in the study they dealt with Indonesia, South Korea and Thailand for the period of 1990-2016.

3. Data and Method

In this study, the impact of public institutional quality on growth is analyzed with panel data analysis for the period of 2002-2019 in EU Countries[3]. The series used in the study; DLGOV series representing institutional quality in public, DLGDP series representing growth, DLGFCF series representing fixed capital investments and DLEMP series representing employment. Institutional quality (DLGDP) series; It was created by taking the arithmetic mean of 6 series that were obtained from the World Bank and representing institutional factors. Similarly, in the studies of Güney (2016) and Şahin (2018), the arithmetic average of these 6 institutional factors was formed and the institutional quality series in the public was created. These 6 series in which the corporate quality series in the public is created are; Government Effectiveness, Regulatory Quality, Control of Corruption, Rule of Law, Voice and Accountability, Political Stability and Absence of Terrorism series. The "percentile rank" forms of these series obtained from the World Bank were preferred. In this form, related variables take a value between 0-100. Summary information regarding the series is shown in the table below.

Table 1. Data and Sources

Variable Code	Variable Name	Source
DLGDP	*GDP (constant 2010 US$)*	*World Bank*
DLGOV $(\frac{a+b+c+d+e+f}{6})$	*(a) Government Effectiveness (percentile rank)* *(b) Regulatory Quality (percentile rank)* *(c) Control of Corruption (percentile rank)* *(d) Rule of Law (percentile rank)* *(e) Voice and Accountability (percentile rank)* *(f) Political Stability and Absence of Violence/Terrorism (percentile rank)*	*World Bank*
DLGFCF	*Gross fixed capital formation (constant 2010 US$)*	*World Bank*
DLEMP	*Employment to population ratio, 15+, total (%) (modeled ILO estimate)*	*World Bank*

[3] EU Countries covered in the study are; Germany, Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Croatia, Holland, Ireland, Spain, Sweden, Italy, Latvia, Lithuania, Luxembourg, Hungary, Malta, Poland, Portugal, Romania, Slovakia, Slovenia and Greece. Malta isn't included in the sample due to lack of data.

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Logarithmic transformation is applied to all series. Descriptive statistics for the series are as follows:

Table 2. Summary Statistics About Data

Variable	Obs	Mean	Std. Dev.	Min.	Max.
DLGOV	442	-0.002	0.012	-0.074	0.067
DLGDP	442	0.022	0.036	-0.160	0.224
DLGFCF	442	0.024	0.108	-0.493	0.664
DLEMP	442	0.003	0.023	-0.135	0.063

Two different models were established in the study and growth was determined as the dependent variable in both models. In Model 1, the effect of public institutional quality series (DLGOV) on growth (DLGDP) series has been investigated. Similarly, in Model 2, the effect of public institutional quality (DLGOV) series on growth (DLGDP) series has been investigated. However, fixed capital investments (DLGFCF) series and employment (DLEMP) series are included in Model 2 as control variables. The econometric forms of the models are as follows:

$$DLGDP_{it} = \beta_0 + \beta_1 DLGOV + \varepsilon_{it} \tag{1}$$

$$DLGDP_{it} = \beta_0 + \beta_1 DLGOV + \beta_2 DLGFCF + \beta_3 DLEMP + \varepsilon_{it} \tag{2}$$

In the study, Pesaran (2004) CD LM Test was used to determine possible cross-sectional dependency in models. The reason why this test is preferred is that it is recommended to be used in the case of N> T in the panel data set. If the probability value of this test is statistically significant at the 5% level, the "H_0: There is no cross-sectional dependency" hypothesis is rejected and the "H_1: There is a cross-sectional dependency" hypothesis is accepted. If the probability value of this test is not statistically significant at the 5% level, the hypothesis "H_0: There is no cross section dependence" is accepted and the "H_1: There is a cross section dependence" hypothesis is rejected.

As can be seen in the results of Pesaran CD LM Test, there is cross section dependency in models. For this reason, Pesaran (2007) CIPS Unit Root Test, which is one of the second generation unit root tests that can make consistent predictions even in case of cross section dependence, was used in the study in order to determine the stationarity in series.

F Test was used to determine the unit and time effects in the models. In determining the unit effect in the model, if the probability result of this test is statistically significant at the 5% level, the "H_0: No unit effect" hypothesis is rejected and the "H_1: There is a unit effect" hypothesis is accepted. On the other hand, if the probability result of this test is not statistically significant at the 5% level, the "H_0: No unit effect" hypothesis is accepted and the "H_1: There is a unit effect" hypothesis is rejected. Similarly, in the determination of the time effect in the model, if the probability result of this test is statistically significant at the 5% level, the "H_0: Time has no effect" hypothesis is rejected and the "H_1: Time has effect" hypothesis is accepted. On the other hand, if the probability result of this test is not statistically significant at the 5% level, the "H_0: Time has no effect" hypothesis is accepted and the "H_1: Time has effect" hypothesis is rejected. If there is both a time effect and a unit effect in the model, it is recommended to use two-way models (Yerdelen Tatoğlu, 2018: 141,171-173).

As it can be seen in the following parts of the study, it was understood that the models used in the study had both time effect and unit effect, so it was decided to use the "Within-Group Estimation Method", which is one of the two-way models. Further, another reason why this method is preferred is that it is recommended to be used in N> T or T> N situations (ibid, 145).

In the study, Hausman (1978) Test was used to determine the fixed and random effects in the models. Accordingly, if the probability value of the Hausman Test is statistically significant at the level of 5%, the "H_0: fixed effects model is valid" hypothesis is accepted and the "H_1: Random effects model is valid" hypothesis is rejected. Differently, if the probability value of the test is statistically insignificant at the level of 5%, the "H_0: fixed effects model is valid" hypothesis is rejected and the "H_1: Random effects model is valid" hypothesis is accepted.

As can be seen in the following parts of the study, it was understood that the fixed effects model was valid in the models in the study. For that reason, the Modified Wald Test (Greene, 2000), which is suitable for use in the fixed effects model, was used to determine the possible heteroscedasticity problem in the models. Accordingly, if the probability value of the test is statistically significant at the 5% level, the hypothesis "H_0: Variance is constant according to units" is rejected and the "H_1: Variance is not constant according to units" hypothesis is accepted. In this case, it is assumed that there is a heteroscedasticity problem in the model. Contrarily, if the probability value of the test is not statistically significant at the 5% level, the hypothesis "H_0: Variance is constant according to units" is accepted and the "H_1: Variance is not constant according to units" hypothesis is rejected. In other words, it is accepted that there is no heteroscedasticity problem in the model.

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Baltagi-Wu Test (Baltagi & Wu, 1999) and Durbin-Watson Test (Bhargava et al., 1982), which are suitable for use in fixed effects model, were used to determine possible autocorrelation problem in models. If the values of Baltagi-Wu and Durbin-Watson Tests are less than 2, the "H_0: Autocorrelation coefficient equals zero" hypothesis is rejected and the "H_1: Autocorrelation coefficient is not equal to zero" hypothesis is accepted. In this case, it is decided that there is an autocorrelation problem in the model. None the less, if the value of Baltagi-Wu Test is greater than 2, the "H_0: Autocorrelation coefficient equals zero" hypothesis is accepted and the "H_1: Autocorrelation coefficient is not equal to zero" hypothesis is rejected. In this situation, it is decided that there is no autocorrelation problem in the model. In this study, if at least one of these two tests gets a value indicating that there is an autocorrelation problem, it will be judged that there is autocorrelation in the model.

Also, "Driscoll-Kraay Standard Errors Estimator" was used for the solution of statistical problems in the models. The reason for using this consistent estimator is that it is recommended to be used in fixed effect models and that the N> T state is valid in the panel data set in the study. In addition, this estimator can make consistent estimates in cases of heteroscedasticity, autocorrelation and inter-unit correlation (Driscoll & Kraay, 1998).

4. Analyse Results

In the study, Pesaran CD LM Test was used to determine whether there is cross-sectional dependency in the models. Because this test is used when N> T in the panel data set. The findings of the Pesaran CD LM Test are shown in the table below. As seen in the findings of the test, it is understood that Model 1 and Model 2 have cross section dependency.

Table 3. Peseran CD LM Test Results for Models

Models	Coef. (Prob.)	Results
Model 1	*2.297 (0.022)*	The H0 hypothesis, which states that there is no cross-sectional dependency, was rejected, and the H1 hypothesis, which states that the cross-sectional dependency exists, was accepted.
Model 2	*2.377 (0.017)*	The H0 hypothesis, which states that there is no cross-sectional dependency, was rejected, and the H1 hypothesis, which states that the cross-sectional dependency exists, was accepted.

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Since there is cross section dependency in Model 1 and Model 2, the stationarities of the series in the models have been investigated with the Pesaran CIPS Unit Root Test, which can make consistent estimates even in case of cross section dependence. Findings regarding the Pesaran CIPS Unit Root Test are also shown in the table below.

Table 4. Pesaran CIPS Unit Root Test Results

Variable	Model	Test Stat.	Critical Values		
			%10	*%5*	*%1*
DLGDP	Constant	-1.908	-2.11	-2.2	-2.38
	Constant Linear Tr.	-2.239	-2.63	-2.72	-2.88
ΔDLGDP	Constant	-4.241	-2.11	-2.2	-2.38
	Constant Linear Tr.	-4.503	-2.63	-2.72	-2.88
DLGOV	Constant	-1.596	-2.11	-2.2	-2.38
	Constant Linear Tr.	-2.396	-2.63	-2.72	-2.88
ΔDLGOV	Constant	-3.111	-2.11	-2.2	-2.38
	Constant Linear Tr.	-3.183	-2.63	-2.72	-2.88
DLGFCF	Constant	-1.183	-2.11	-2.2	-2.38
	Constant Linear Tr.	-2.380	-2.63	-2.72	-2.88
ΔDLGFCF	Constant	-3.360	-2.11	-2.2	-2.38
	Constant Linear Tr.	-3.420	-2.63	-2.72	-2.88
DLEMP	Constant	-1.210	-2.11	-2.2	-2.38
	Constant Linear Tr.	-2.555	-2.63	-2.72	-2.88
ΔDLEMP	Constant	-3.233	-2.11	-2.2	-2.38
	Constant Linear Tr.	-3.280	-2.63	-2.72	-2.88

As seen in the unit root test results, all series are stationary in I(1). For this reason, the first differences of the series were taken and models were created. Then, the unit and time effects in the models were investigated with the F test and the findings obtained are reported in the table below.

Table 5. F Test Results for Determining Unit and Time Effects

Effects	Models	
	Model 1	*Model 2*
Unit	1.94 (0.005)*	1.90 (0.006)*
Time	24.95 (0.000)*	9.45 (0.000)*
Suitable Model	Bilateral Model	Bilateral Model

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Note: Values in parantheses are probility values, others are coefficients.

In the table above, it can be seen that the probability values of the F Test in Model 1 and Model 2 are statistically significant at 5% level for both unit effects and time effects. Particularly, it is stated that there are both unit effects and time effects in Model 1 and Model 2. Therefore, it is understood that two-way models are valid for both models.

Besides, as seen in the table below, it is understood that the probability value of the Hausman Test is statistically significant at the 5% level in Model 1 and Model 2. So, fixed effect models are valid in both models. For this reason, the use of the Within-Group Estimation Method, one of the two-way estimation methods, was preferred in the study. Because it is proper to use the Within-Group Estimation Method in two-way fixed effects models. Further, another reason why this method is preferred is that it is recommended to be used in N> T or T> N situations as in the data set used in this study.

Table 6. Estimation Results for Models

| | Depended Variable: DLGDP | | | |
| | Model 1 | | Model 2 | |
	Uncorrected Model	Corrected Model	Uncorrected Model	Corrected Model
DLGOV	0.159 (0.011)*	0.200 (0.011)*	0.116 (0.012)*	0.119 (0.025)*
DLGFCF	-	-	0.137 (0.000)*	0.191 (0.001)*
DLEMP	-	-	(0.353 0.000)*	0.432 (0.002)*
C	-	0.021 (0.005)*	-	0.016 (0.000)*
Hausman Test Stat. (Prob.)	11.13 (0.001)	-	102.39 (0.000)	-
Model	Fixed Effect	-	Fixed Effect	-
Modified Wald Test Stat. (Prob.)	567.95 (0.000)	-	1599.07 (0.000)	-
Durbin-Watson Stat.	1.229	-	1.928	-
Baltagi-Wu LBI Stat.	1.263	-	2.020	-

Note: Values in parantheses are probility values, others are coefficients.

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In the "uncorrected model" column under Model 1 in the above table, the findings of Model 1 estimated by the Intra-Group Estimation Method are included. As can be seen here; representing the institutional quality in the public, the DLGOV series, with a statistical significance level of 5% with a coefficient of 0.159; It is understood that it positively affects the DLGDP series representing economic growth. Specifically, as the institutional quality in the public increases, economic growth increases.

The statistically significant 5% probability value of the Modified Wald Test for Model 1 indicates that there is a heteroscedasticity problem in the model. Again, the value of Durbin-Watson and Baltagi-Wu Tests taking a value less than 2 means that there is an autocorrelation problem in the model. Driscoll-Kraay estimator was used to solve the related problems in Model 1 and the findings were reported in the "corrected model" column of Model 1. As seen in the findings obtained; representing the institutional quality, the DLGOV series, with a coefficient of 0.200, at a statistical significance level of 5%; It is understood that it positively affects the DLGDP series representing economic growth. In other words, as the institutional quality in the public increases, economic growth increases. Accordingly, the Driscoll-Kraay estimator gives similar results for Model 1.

In the "uncorrected model" column under Model 2, the findings of Model 2 estimated by the Intra-Group Estimation Method are included. As can be seen here; representing the institutional quality in the public, the DLGOV series, with a statistical significance level of 5% with a coefficient of 0.116; The DLGFCF series representing fixed capital investments has a statistical significance level of 0.137 with the coefficient of 1% and the DLEMP series representing employment at a statistically 1% significance level with a coefficient of 0.353; It is understood that it positively affects the DLGDP series representing economic growth. Apart from the effects on fixed capital investments and employment, it is understood that the higher the institutional quality in the public sector, the higher the economic growth.

The probability value of the Modified Wald Test for Model 2 that is statistically significant at the 5% level indicates that there is a heteroscedasticity problem in the model. Over, the value of Durbin-Watson Test having a value less than 2 means that there is an autocorrelation problem in the model. However, the fact that the value of Baltagi-Wu Test is above 2 indicates that there is no autocorrelation problem in Model 2. In this study, if at least one of these two tests shows that there is an autocorrelation problem in the model, it is accepted that there is an autocorrelation problem in the model. For this reason, the Driscoll-Kraay estimator was used to solve the related problems and the

findings were reported in the "corrected model" column of Model 2. According to this; The DLGOV series, which represents the institutional quality in the public, has a statistical significance level of 5% with a coefficient of 0.119; The DLGFCF series representing fixed capital investments has a statistical significance level of 1% with a coefficient of 0.191 and a statistically significant level of 1% with a coefficient of 0.432 for the DLEMP series representing employment; It is understood that it positively affects the DLGDP series representing economic growth. Apart from the effects on fixed capital investments and employment, it is understood that the higher the institutional quality in the public sector, the higher the economic growth. Thus, the Driscoll-Kraay estimator also gives similar results for Model 2.

5. Conclusion

Various problems of public administration stemming from structural aspects and the attitudes and behaviors of civil servants can have an impact on the economies of the countries. Offices that are constantly growing, expanding, increasing their rules and expenditures, and which are monopolizing over; they are criticized for not being efficient and efficient. On the other hand, bureaucrats go beyond the limits of the authority defined by laws, carry out services according to their personal interests, weakness of accountability; They are opposed on the grounds that they do not care about the purpose of public benefit. In this study; The parameters determined such as state efficiency, regulatory quality, control of corruption, rule of law, accountability, political stability and the absence of violence / terrorism were examined within the scope of institutional quality in the public and the effect of these variables on economic growth was investigated.

In this study, the effect of institutional quality in the public sector on growth in EU countries for the period of 2002-2019 was analyzed with panel data analysis. The series used in the study; DLGOV series representing institutional quality in public, DLGDP series representing growth, DLGFCF series representing fixed capital investments and DLEMP series representing employment. Enterprise quality (DLGDP) series; It was created by taking the arithmetic mean of 6 series that were obtained from the World Bank and representing institutional factors.

In the study, Pesaran CD LM Test was used to determine whether there is cross-sectional dependency in the models. Because this test is used when N> T in the panel data set. The findings of the Pesaran CD LM Test show that there is cross-sectional dependency in Model 1 and Model 2. Since there is cross section dependency in Model 1 and Model 2, the stationarities of the series in the models have been investigated with the

Pesaran CIPS Unit Root Test, which can make consistent predictions even in case of cross section dependence.

It is seen that the probability values of the F Test in Model 1 and Model 2 are statistically significant at the 5% level for both unit effects and time effects. Especially, it is stated that there are both unit effects and time effects in Model 1 and Model 2. Consequently, it is understood that two-way models are valid for both models.

It is understood that the probability value of the Hausman Test is statistically significant at the 5% level in Model 1 and Model 2. Therefore, fixed effect models are valid in both models. For this reason, the use of the Within-Group Estimation Method, one of the two-way estimation methods, was preferred in this study. Because it is appropriate to use the Within-Group Estimation Method in two-way fixed effects models. Also, another reason why this method is preferred is that it is recommended to be used in $N > T$ or $T > N$ situations as in the data set used in this study.

According to the findings of Model 1 estimated by the Intra Group Estimation Method; representing the institutional quality in the public, the DLGOV series, with a statistical significance level of 5% with a coefficient of 0.159; It is understood that it positively affects the DLGDP series representing economic growth. In other words, as the institutional quality in the public increases, economic growth increases.

The statistically significant 5% probability value of the Modified Wald Test for Model 1 indicates that there is a heteroscedasticity problem in the model. Anew, the value of Durbin-Watson and Baltagi-Wu Tests taking a value less than 2 means that there is an autocorrelation problem in the model. Driscoll-Kraay estimator was used to solve the related problems in Model 1. According to the findings obtained from this estimator; representing the institutional quality, the DLGOV series, with a coefficient of 0.200, at a statistical significance level of 5%; It is understood that it positively affects the DLGDP series, which represents economic growth. In other words, as the institutional quality in the public increases, economic growth increases. Therefore, the Driscoll-Kraay estimator also gives similar results for Model 1.

According to the findings of Model 2 estimated by the Intra-Group Estimation Method; The DLGOV series, which represents the institutional quality in the public, has a statistical significance level of 5% with a coefficient of 0.116; The DLGFCF series representing fixed capital investments has a statistical significance level of 0.137 with the coefficient of 1% and the DLEMP series representing employment at a statistically 1% significance level with a coefficient of 0.353; It is understood that it positively affects the DLGDP series, which represents economic growth. Apart from the effects on fixed capital

investments and employment, it is understood that the higher the institutional quality in the public sector, the higher the economic growth.

The probability value of the Modified Wald Test for Model 2 that is statistically significant at the 5% level indicates that there is a heteroscedasticity problem in the model. If the value of Durbin-Watson Test is less than 2, it means that there is an autocorrelation problem in the model. However, the fact that the value of Baltagi-Wu Test is above 2 indicates that there is no autocorrelation problem in Model 2. In the study, if at least one of these two tests shows that there is an autocorrelation problem in the model, it is accepted that there is an autocorrelation problem in the model. For this reason, Driscoll-Kraay estimator was used to solve the related problems. According to the findings obtained from this estimator; representing the institutional quality in the public, the DLGOV series, with a statistical significance level of 5% with a coefficient of 0.119; The DLGFCF series representing fixed capital investments has a statistical significance level of 1% with a coefficient of 0.191 and a statistically significant level of 1% with a coefficient of 0.432 for the DLEMP series representing employment; It is understood that it positively affects the DLGDP series, which represents economic growth. Farther the effects on fixed capital investments and employment, it is understood that the higher the institutional quality in the public sector, the higher the economic growth. Thus, the Driscoll-Kraay estimator also gives similar results for Model 2.

As can be understood from the findings of the study, the effect of institutional quality on economic growth in European Union countries is statistically verified. Therefore, we observe that institutional factors are important both for achieving economic growth and for a sustainable growth trend. Accordingly, based on the example of EU countries in this study, we propose; the countries that wants to increase their economic performance should give importance to the institutional quality.

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